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ANATOMICAL VARIATIONS AND PALAEOPATHOLOGICAL OBSERVATIONS IN PREHISTORIC SERIES

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Abstract

A study was made of anthropological finds mainly from the area of Southern Hungary, and dating from the Neolithic, inclusive of the Iron age. Seven anatomical variations, 12 other morphological variations, 2 congenital anomalies, exostoses, changes related with the circulatory system, pathological cases, tumours, traumas and dental diseases were diagnosed. Such phenomena were observed in a total of 95 individuals, in many cases several of the phenomena being found in a given individual. All this evidence indicates that even the populations living several thousand years ago included the most varied pathological cases, which appear to have increased in number as a consequence of the change-over to agriculture and the establishment of human settlements. Without the excavation of complete burial-grounds, it is not possible to give an exact and reliable answer to the question of the frequency of these phenomena in a population. With the observation and publication of the cases involved, it was intended to draw attention to phenomena of interest and importance from a medical-historical aspect, in finds originating from the Neolithic.

Introduction

Very few palaeoanthropological finds exist, in which there are no lesions in at least one of the bones. The differentiation of the anatomical variations and congenital anomalies seems a relatively simple task, but the situation is much more difficult with the pathological cases. The study of these is unquestionably justified today in a palaeoanthropological evaluation, since they can provide valuable information regarding the biological structure of the population. Research of such a nature is hampered by two main problems primarily:

a) it is only in extremely rare cases that the research worker has the possibility to deal with the finds originating from excavation of a complete burial-ground, and consequently there is no way to observe the overall manifested change or variation;

b) establishment of an accurate diagnosis is particularly difficult in the case of the palaeopathological changes.

We have tried to solve these two problems by incorporating into the investigation a large set of finds from an archaeological period which have so far not been reported, while in addition we have taken into account publications which contain detailed descriptions and good illustrations with regard to the changes in question.

Examination material

A study was made of those skeletons (mainly crania) from the palaeoanthropological collection of the Department of Anthropology of Attila József University, which originate from authenticated sites dating from the Neolithic, inclusive of the Iron Age. The finds in which some change was observed are listed briefly below. The scope of this paper does not permit us to give an exact description of every individual skeleton; accordingly, the changes have been numbered (from 1 to 45), and in the treatment of the individual finds and of the changes the relavant symptoms are indicated by the appropriate number in brackets. At the same time, the most typical cases are presented in photographs.

Neolithic age

A. Kőrös group

No. 1936. Endrőd. Excavated by Ferenc Móra in 1930. Mature male. (22, 42 Taxon: n—m.

No. 131. Grave 25/1. Hódmezővásárhely-Kotacpart-Vata farm (BANNER, 1935). Adult male. (10, 40) Taxon: pn-x.

B. Tisza culture

No. 161. Grave 2. Hódmezővásárhely—Kökénydomb—Szabó (Kapocsi) farm (BANNER, 1951). Adult female. (26, 42). Taxon: am-pn.

No. 159. Hódmezővásárhely—Kökénydomb—Vörös farm (BANNER, 1940). Juvenile-adult female. (2, 2c, 3).

No. 4392. Grave 2. Nádudvar—Farkaslóré—Vörös Csillag Cooperative Farm (GAZDAPUSZTAI, 1963). Child of Infantia II age. (2, 29).

No. 4054. Grave 4. Hódmezővásárhely—Gorzsa—Czukor farm (GAZDAPUSZTAI, 1963a). Adult female. (42). Taxon: am-crA.

No. 4056. Grave 7. Hódmezővásárhely—Gorzsa—Czukor farm. Juvenile female. (29).

No. 7963. Grave 1. Vésztő—Mágori Hill (HEGEDŰS, 1973). Adult female. (3, 38). Taxon: n.

No. 7966. Grave 4. Vésztő—Magori Hill. Adult female. (43). Taxon: am-x.

No. 7968. Grave 6. Vésztő—Mágori Hill. Mature female. (1a, 38, 42). Taxon: n-x.

No. 7969. Grave 7. Vésztő—Mágori Hill. Mature male. (5a, 42). Taxon: n-am.

C. Neolithic finds not classified into ages

No. 3955. Mogyorós. Excavated by Ferenc Móra in 1930. Adult female. (3a, 43). Taxon: n-crB.

No. 3510. Grave A. Ószentiván VIII. (B. KUTZIÁN, 1961). Senile male. (21, 32 37). Taxon: pn-x.

Copper Age

A. Tiszapolgár culture

No. 1948. Grave 12. Deszk-A (FOLTINY, 1941). Mature male. (2). Taxon: am-pn.

No. 102. Grave 7/15. Hódmezővásárhely—Kotacpart—Vata farm. 1932—33 (B. KUTZIÁN, 1972). Senile male. (22). Taxon: pn.

No. 104. Grave 7/17. Hódmezővásárhely—Kotacpart—Vata farm, 1932—33. Senile female. (11). Taxon: crA-x.

No. 140. Sporadic. Hódmezővásárhely—Kotacpart—Vata farm, 1933—34 (BANNER, 1933—34). Mature-senile male. (2, 3a). Taxon: a-crB.

No. 1934. Grave 4. Lebő-A Farkas farm (B. KUTZIÁN, 1972). Mature male. (3a, 22, 31, 35). Taxon: pn-x.

No. 1433. Grave 1. Ószentiván (TÓTH, 1942). Juvenile female. (2). Taxon: am-x.

No. 3508. Grave 2. Ószentiván VIII (B. KUTZIÁN, 1961). Senile male. (2, 2c, 3, 8, 22a). Taxon: am-x.

B. Bodrogkeresztúr culture

No. 437. Grave 2. Magyarteés (PATAY, 1943). Adult male. (39).

No. 438. Grave 6. Magyarteés. Senile male. (23, 42). Taxon: crA-pn.

No. 1025. Designation 7. Szentes—Kistőke—Szegi farm (ZALOTAY, 1933—34; PATAY, 1943). Adult female. (2, 5a). Taxon: a-crB.

C. Pécel culture

No. 2664. Grave 8. Baja—Dózsa György St. 233 (KŐHEGYI, 1961). Senile male. (3a). Taxon: pn-crA.

Bronze Age

A. Early Bronze Age

No. 123. Röszke. Senile male. (23, 32, 35).

No. 3619. Grave 138. Szolnok—Rákóczifalva—Kastélydomb (CSALOG, 1963). Senile male. (17, 43). Taxon: crB-crA.

No. 170. Grave 10. Szőreg-C (FOLTINY, 1941a). Adult male. (2, 29, 31). Taxon: am-pn.

No. 174. Grave 20. Szőreg-C. Senile female. (31, 32). Taxon: n-m.

No. 176. Grave 24. Szőreg-C. Child of Infantia II age. (29).

No. 180. Grave. 29. Szőreg-C. Mature male. (11). Taxon: am-m.

No. 183. Grave 36. Szőreg-C. Senile male. (1, 23). Taxon: pn-x.

No. 197. Grave 62. Szőreg-C. Mature male. (2). Taxon: n-crB.

No. 207. Grave 74. Szőreg-C. Adult male. (2, 3a, 5, 15, 43). Taxon: am-pn.

No. 229. Grave 103. Szőreg-C. Child of Infantia II age. (25).

No. 241. Grave 120. Szőreg-C. Adult male. (18). Taxon: pn-crA.

No. 251. Grave 135. Szőreg-C. Mature female. (2, 27). Taxon: am-crA.

No. 1737. Szőreg—Pálfy brickworks. Adult male. (3a, 9, 19, 22, 24, 36). Taxon: pn.

B. Middle Bronze Age.

No. 4039. Grave 63. Deszk-A (FOLTINY, 1941). Adult male. (2). Taxon: am-m.

No. 1615. Grave 81a. Deszk-A. Mature female. (2, 5b, 22, 44). Taxon: d-p.

No. 2410. Grave 8. Deszk-F (FOLTINY, 1942). Adult male. (3a, 14,42). Taxon: am-crB.

No. 2414. Grave 14. Deszk-F. Adult male. (16).

No. 2415. Grave 15. Deszk-F. Adult female. (2, 3). Taxon: crB-am.

No. 327. Grave 26. Deszk-F. Adult male. (23).

No. 328. Grave 31. Deszk-F. Senile male. (23, 43). Taxon: n-x.

No. 329. Grave 32. Deszk-F. Mature male. (23, 43). Taxon: am-x.

No. 331. Grave 41. Deszk-F. Senile female. (23, 32, 43).

No. 332. Grave 45. Deszk-F. Adult female. (43). Taxon: a-crB.
No. 333. Grave 46. Deszk-F. Adult male. (2, 3, 5, 7, 22, 29). Taxon: n-am.
No. 337. Grave 60. Deszk-F. Mature male. (23, 35, 43). Taxon: pn-m.
No. 338. Grave 63. Deszk-F. Adult male (?). (2, 22). Taxon: a-x.
No. 339. Grave 64. Deszk-F. Mature female. (32).
No. 340. Grave 67. Deszk-F. Mature male. (23, 24, 31). Taxon: d.
No. 341. Grave 68. Deszk-F. Adult male. (23). Taxon: am-x.
No. 169. Grave 9. Szőreg-C (FOLTINY, 1941a). Senile female. (28). Taxon: pn-x.
No. 172. Grave 13. Szőreg-C. Adult female. (2, 5a, 22). Taxon: am-crB.
No. 177. Grave 26. Szőreg-C. Adult male. (2, 3a, 5a, 11). Taxon: n-crA.
No. 182. Grave 35. Szőreg-C. Senile male. (43). Taxon: crA-a.
No. 198. Grave 64. Szőreg-C. Adult female. (29). Taxon: am-m.
No. 201. Grave 67. Szőreg-C. Mature male. (39). Taxon: am-crA.
No. 214. Grave 84. Szőreg-C. Mature male. (3a). Taxon: pn-am.
No. 216. Grave 86. Szőreg-C. Mature female. (43). Taxon: am-n.
No. 235. Grave 109. Szőreg-C. Adult female. (2, 3, 10, 42, 43). Taxon: am-n.
No. 236. Grave 110. Szőreg-C. Adult male. (1, 43). Taxon: crA-x.
No. 252. Grave 136. Szőreg-C. Adult male. (2, 20, 42, 43). Taxon: pn-am.
No. 254. Grave 138. Szőreg-C. Mature female. (29, 40, 42, 43). Taxon: crB-am
No. 258. Grave 146. Szőreg-C. Adult male. (2, 6). Taxon: am.
No. 270. Grave 166. Szőreg-C. Child of Infantia II age. (2, 2a, 2b, 2c, 4, 13, 29)
No. 271. Grave 167. Szőreg-C. Child of Infantia I age. (29, 30).

C. Late Bronze Age

No. 325. Grave 22. Deszk-F (FOLTINY, 1942). Senile male. (3a, 22, 23, 43). Taxon: n-crA.

No. 3558. Grave 57. Szolnok—Rákóczifalva—Kastélydomb (CSALOG, 1963). Adult male. (2, 31).

No. 3631. Grave 155. Szolnok—Rákóczifalva—Kastélydomb. Adult male. (43). Taxon: m-n.

No. 3636. Grave 163. Szolnok—Rákóczifalva—Kastélydomb. Adult female. (2, 42).

No. 209. Grave 76. Szőreg-C (FOLTINY, 1941a). Mature female. (9, 42). Taxon: am-m.

No. 219. Grave 89a. Szőreg-C. Adult female. (45). Taxon: am-crA.
No. 220. Grave 89b. Szőreg-C. Child of Infantia II age. (2, 29).
No. 237. Grave 112. Szőreg-C. Mature male. (2, 5a, 43). Taxon: p-crB.
No. 257. Grave 144. Szőreg-C. Senile female. (43). Taxon: a-crB.
No. 266. Grave 160. Szőreg-C. Senile female. (32).

D. Bronze Age finds not classified into ages

No. 5284. Grave 1. Hódmezővásárhely—State Farm. Adult male. (2, 23, 41).

No. 5285. Hódmezővásárhely—State Farm. Mature male. (3, 23, 33, 38). Taxon: pn-crA.

No. 3561. Grave 63. Szolnok—Rákóczifalva—Kastélydomb (CSALOG, 1963). Mature male. (2, 2a, 22, 42, 43). Taxon: n-am.

No. 3599. Grave 110. Szolnok—Rákóczifalva—Kastélydomb. Mature female. (2).

No. 3507. Szolnok—Waterworks. Mature male. (23, 30).

No. 190. Grave 54. Szőreg-C (FOLTINY, 1941a). Mature male. (2, 12, 38, 43). Taxon: crB-n.

No. 224. Grave 97. Szőreg-C. Adult female. (3, 5a 42, 43). Taxon: a-crA.

No. 274. Szőreg-C. Adult male. (3a, 24, 29, 31). Taxon: m-crA.

Iron Age

No. 3175. Grave 1. Csanytelek. Adult female. (2, 5b, 10).

No. 3176. Grave 2. Csanytelek. Mature male. (2). Taxon: crB-x.

No. 3177. Grave 3. Csanytelek. Child of Infantia II age. (35).

No. 3178. Grave 4. Csanytelek. Adult female. (2). Taxon: crB-a.

No. 4049. Grave 3. Kishomok—Lenin Cooperative Farm (GAZDAPUSZTAI, 1964). Adult female. (3, 31). Taxon: am-n.

No. 1429. Grave 1. Lebő (PÁRDUCZ, 1942). Mature male. (22, 23, 34). Taxon: n-am.

No. 1430. Grave 2. Lebő. Senile male. (5a, 22b, 42, 43). Taxon: crA.

No. 368. Grave 1. Szentes—Vekerhát (PÁRDUCZ, 1940). Mature female. (23, 42, 43). Taxon: crB-x.

No. 434. Grave 1. Szentes—Vekerzug—Bleierföld. Excavated by Gábor Csallány. Adult female. (2, 38). Taxon: a-crB.

The taxon establishment was carried out by the method of LIPTÁK (1962, 1965, 1971), according to the average values elaborated (FARKAS, 1972) on the basis of Lipták's reported finds. In accordance with this, the letters used for taxon designations have the same sense as given by LIPTÁK.

Tables 1—3 provide information on the distributions of the above finds according to sex, age of death, taxon and archaeological period.

Table 1. Distributions of the examination series according to sex and archaeological age.

Archaeological age		Male	Female	Children	Total
Stone Age	Körös group	2	—	—	2
	Tisza culture	1	7	1	9
	Unclassified	1	1	—	2
	Total	4	8	1	13
Copper Age	Tiszapolgár	5	2	—	7
	Bodrogkeresztur	2	1	—	3
	Pécel	1	—	—	1
	Total	8	3	—	11
Bronze Age	Early	9	2	2	13
	Middle	18	11	2	31
	Late	4	4	1	9
	Unclassified	6	3	—	9
	Total	39	20	5	62
Iron Age		3	5	1	9
Total		52	36	7	95

It is quite clear from Table 1 that on the occasion of the recovery of the various finds the skeletons of children were recovered only in low numbers. Correspondingly, very few child-skeletons occur among the examination series.

Table 2 reflects the well-known relation that there is a significant difference between the ages of death for males and females. In this series too it is observed that the number of males of mature and senile age (32) is well in excess of the corresponding number of females of the same age (15).

Table 2. Distributions of the examination series according to sex and age.

Age	Male	Female	Children	Total	
				n	%
Infantia I	—	—	1	1	1.0
Infantia II	—	—	6	6	6.3
Juvenile	—	3	—	3	3.2
Adult	21	18	—	39	41.1
Mature	19	9	—	28	29.5
Senile	12	6	—	18	18.9
Total	52 54.7%	36 37.9%	7 7.4%	95	

Table 3 gives the distribution according to taxon. It well illustrates the proportions of human species to be observed in prehistoric material. Thus, in addition to the 26 Mediterraneans, 26 nordoid, 12 cromagnoid and 10 brachycephalic taxons

Table 3. Distribution of the examined adult finds according to taxon and sex.

Taxon	Male	Female	Totale	
			n	%
Nordoids:				
Protonordic (pn)	12	1	13	14.7
Nordic (n)	9	4	13	14.7
Cromagnoids:				
Cromagnoid-A (crA)	4	1	5	5.6
Cromagnoid-B (crB)	3	4	7	7.9
Mediterraneans:				
Gracile mediterranean (m)	2	—	2	2.2
Atlantomediterranean (am)	11	12	23	26.1
Brachycephalics:				
Alpine (a)	2	5	7	7.9
Dinarian (d)	1	1	2	2.2
Pamirian (p)	1	—	1	1.1
Undetermined	7	8	15	17.0
Total	52	36	88	

occured, which is primarily correlated with the southern origins of the prehistoric population. A difference in taxonomic composition between the two sexes can be seen essentially only in case of the nordoid group, for there are almost four times as many of these among the males as among the females.

Anatomical variations, congenital anomalies

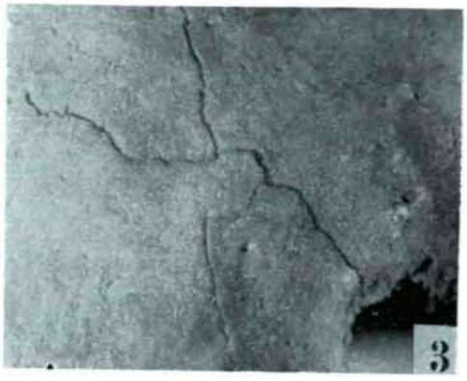
The anatomical variations are the results of changes occurring during the ossification process, and the heredity-course of these is not known exactly. BROTHWELL (1959) proposes the examination of 10 (non-metric) features to demonstrate the biological distance between populations.

Fig. 1. Szőreg-C, early Bronze Age, No. 183, Grave 36. — Large uniform os apicis.
Fig. 2. Szőreg-C, middle Bronze Age, No. 270, Grave 166. — Wormian bone in the sutura sagittalis.

The os apicis is a uniform or divided bone situated in the sutura lambdoidea, in the interparietal angle of the os occipitale (MARTIN—SALLER, 1957—1966). It occured as a uniform bone (1) in two finds from Szőreg (Fig. 1), but the variant divided into three parts (os apicis tripartium) (1a) was also observed in one cranium.

The wormian bones are larger or smaller bone-islands situated in the sutures HESS, 1946; MARTIN—SALLER, 1957—1966; KENNETH, 1965). Of the anatomical variations examined, this was found with the highest frequency. The distribution according to sex of the wormian bone occurring in the sutura lambdoidea (2): 18 males, 13 females and 3 children. It was found in the sutura coronalis (2a) in two cases. In one find it was observed in the pars obelica of the sutura sagittalis (2b) (Fig. 2), and was also to be seen in the sutura parietomastoidea (2c). Wormian bones in similar sites were found in a further two crania.

The sutura metopica (3) is a persisting foetal frontal suture, which normally occludes during the first two years after birth (ESSEN—HÖLLER, 1928). This was found in 9 crania (3 males, 6 females) among our material. The supranasal sutural residue (3a), which is a residue of the foetal frontal suture (MARTIN—SALLER, 1957—1966), was observed in 11 crania (10 males, 1 female).



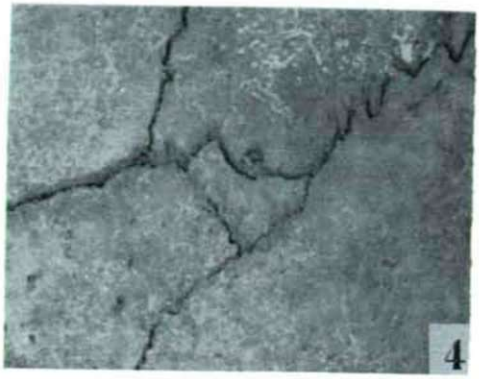


Fig. 3. Szőreg-C, middle Bronze Age, No. 270, Grave 166. — Right-side processus frontalis ossis temporalis.
Fig. 4. Szőreg-C, late Bronze Age, No. 237, Grave 112. — Os epiptericum.

Of the variations of the pterion region (MARTIN—SALLER, 1957—1966), the processus frontalis ossis temporalis (4) occurred on the right side in the cranium of one child (Figs. 3 and 7). A fairly frequent variation of this region is the appearance of an independent bone, the os epiptericum, which is generally regarded as the wall bone of the temporal bone (MARTIN—SALLER, 1957—1966). This was observed in 6 males, in 2 on both sides (5) and in 4 (Fig. 4) only on the left side (5a), and also in 5 females, in 3 on the left side and in 2 on the right side (5b).

The os bregmaticum (6) is a fontanelle which occurs partly symmetrically, and partly asymmetrically in the initial section of the sutura sagittalis, but it is also found extending into the frontal bone. Its appearance is relatively rare (MARTIN—SALLER, 1957—1966). It is restricted to one case in our material (Fig. 5).

The processus paramastoideus or paracondyloideus (7) is an extremely rare variation (MARTIN—SALLER, 1957—1966), and similarly occurred in only one case in our material.

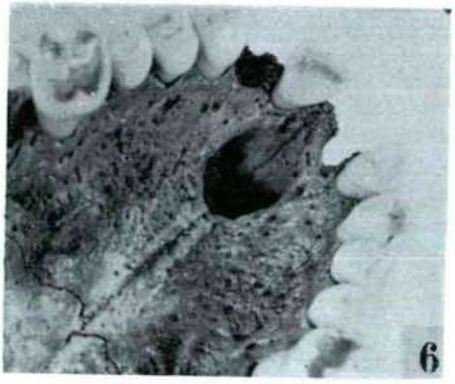


Fig. 5. Szőreg-C, middle Bronze Age, No. 258, Grave 146. — Os bregmaticum
Fig. 6. Hódmezővásárhely—Kotacpart—Vata farm, early Neolithic (Kőrös group), No. 131. Grave 25/1. — Large foramen incisivum

Variations of other morphological characteristics were also observed:

the left-side canalis nervi hypoglossi (8) was larger than the average in one case;

supernumerary right-side foramen infraorbitale (9) was found in two cases;

a large foramen incisivum (10) could be seen in three cases (Fig. 6). In such a case the possibility of a cyst may come to mind (BALOGH, 1958);

the right-side foramen jugulare was larger (11) than the left in three cases. The enlargement of the right foramen may well be indicative of the left-handedness of the individual, for the pathological change can be assumed due to the over-narrowing of the left foramen (CHARVART—PACOVSKY—DUBOVSKY, 1964);

foramen jugulare bipartitum (12) can be seen on both sides in the cranium of one male;

the fissura sphenopetrosa is strikingly wide (13) in the case of one child. Since, apart from the crossing of the nervus petrosus superficialis major and minor, this fissure also acts as an emissary (KISS, 1953), in this child the veins in this region may have been larger or supernumerary;

the partition of the left capitulum mandibulae (14) occurred in one case;

similarly, bipartition of the right ala magna (15) was observed in one case (Fig. 7);

the left angle of the mandibula was inclined inwards markedly (16) in one male;

the crista occipitalis externa appeared in the form of a strong ridge (17) in one cranium;

the spina mentalis was unusually strongly developed (18) in one case. Muscle-adhering bone fissures with abnormal development are in a causel relation generally with a musculature hypertrophized because of over-stressing. One form of this is strong development of the spina mentalis (REGÖLY—MÉREI, 1962);

the right foramen mentale is larger (19) than the left in one find.

Of the congenital anomalies, mention may be made of the condylus tertius (20), which was found in one case (Fig. 8).

Assimilation of the os coccygis (21) was observed in the sacrum of one male.

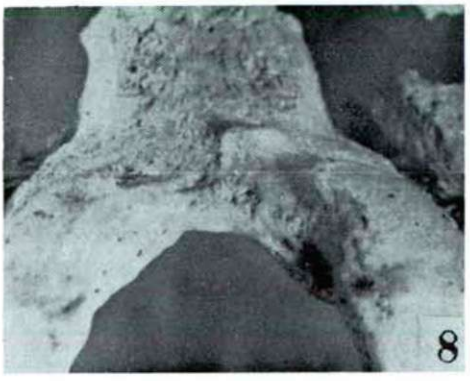


Fig. 7. Szőreg-C, early Bronze Age, No. 207, Grave 74. — Right-side os epiptericum and divided ala magna.

Fig. 8. Szőreg-C, middle Bronze Age, No. 252, Grave 136. — Condylus tertius.

Exostoses

The esoxtoses can be observed in the region of the palatum durum (22), mainly near the molars, in the form of larger or smaller ridges, but they may also occur on the left ramus mandibulae (22a), as was observed on the lower mandible of one male. A similar case may also appear on the ala magna (22b) (one case).

Of the total of 13 exostoses observed (including the two mentioned), with the exception of two females all occurred in male finds. With one exception, advanced dental abrasion too was found in these. It is seen that this may be connected with the oral cavity and masticatory muscles, and because of this the fairly frequent occurrence may be explained by over-loading (REGÖLY—MÉREI, 1962). This assumption is contradicted, however, by cases of crania where the masticatory surface on the teeth is very worn, but at the same time exostosis is not found on the palatum durum.

Changes related with the circulatory system

The abnormal number, position and size of formations (foveoles granulares, Pacchioni granules, sulci arteriosi) on the endocranial surface of the crania were also examined (23).

The Pacchioni granules are the formations of the arachnoidea, which are papilla-like prominences on both sides of the fissura interhemisphaerica. They penetrate into the venous sinuses of the dura mater. In old age they increase in number, and thus the number of indentations corresponding to the Pacchioni granules also rises. The granules have the function of acting as baroreceptors to measure the pressure of the cerebrospinal fluid. Those situated farther from the mesial line also penetrate into venous lacunae which are in connection with the sinuses. Corresponding to these large lacunae, smaller indentations (foveoles granulares) are found on the parietal bones (KISS, 1953; RATKÓCZY, 1959). These changes have also been demonstrated in palaeoanthropological material (NEMESKÉRI—HARSÁNYI—GERENCSÉR, 1973). As regards the sulci arteriosi in another site (REGÖLY—MÉREI, 1962) it was found that the broadened and deepened vascular sulci may appear as a consequences of an intracranial pressure increase.

The frequency of combined occurrence of these formations too was examined, but only the individuals were regarded as pathological who belonged to the adult age group (since the number of Pacchioni granules rises with age). A larger than average number of Pacchioni granules with a deep vascular sulcus appeared in the case of two adult males; supernumerary foveoles granulares and a deep vascular sulcus were observed on the endocranial surface of one male cranium. Similar changes were found in a further 13 individuals (11 males and 2 females), all of them belonging in the mature or senile age groups.

Special attention should be paid to a fine network of thin vascular sulci (24) on the margo supraorbitalis and the arcus superciliaris (3 individuals). Changes of this nature were observed on prehistoric men finds by TAPPEN (1973).

Other pathological changes

Synostosis praecox (25) is the premature synostosis of the cranial bones, primarily along the sutura sagittalis and coronalis (BARTUCZ, 1966). In our material this could be observed on the region of the sutura sagittalis in one child (of Inf. II age).

Less serious hydrocephalus (26) is indicated by the large cranium of an adult female. Such changes have previously been described in a palaeoanthropological material (BROTHWELL, 1965).

The osteomas (27) are slowly-growing, benign bone tumours. They may also appear on the calvaria, customarily in the form of small, round protuberance (HARANGHY, 1966). A protuberance about half a centimetre in diameter was observed on the frontal bone of one individual. Osteoma agreeing with our case is found in the work of VYHNÁNEK (1971).

A particularly great problem was caused by a round foramen (28), approximately half a centimetre in diameter, situated in the upper lateral wall of the orbit of one cranium and in the spongiosa. The opening is surrounded by the sulci of a rich vascular network. No other changes can be observed in the cranium, and the indentation penetrating into the spongiosa is not in connection with the sinus frontalis. Since a change of a quite local nature is involved and the literature shows no photographs relating to this phenomenon, we thought of the following aetiological factors:

a) some change of the glandula lacrimale, which induced a secondary bone destruction;

b) angioma, which according to REGÖLY—MÉREI (1962) can also arise in the medulla, mainly in the form of haemangioma capillare. The various forms of haemangioma can also occur in the adipose tissue (orbit) (HARANGHY, 1966);

c) orbital infection.

The foramination of the upper medial wall of the orbital tegmen was termed by WELCKER (1888) cribra orbitalia (29). The osteoporotic area occurring in the parietal region of the calvaria (when the tabula externa disappears and the enlarged spongiosa becomes visible on the surface) is usually referred to as hyperostosis spongiosa cranii (HAMPERL—WEISS, 1955) (30). Our evaluations of these phenomena were based on the work of other authors (NATHAN—HAAS, 1966). Because of the low number of cases a difference in sex could not be established, but at any event it is striking that there are a significant number of child-crania exhibiting the change. Three basic types were observed (NATHAN—HAAS, 1966): porotic, cribrotic and trabecular. Accordingly, the following cases occurred in our examination material: porotic change in 1 male, 2 females and 1 child; cribrotic change in 1 male, 2 females (Fig. 9) and 3 children. The cribra orbitalia of one child forms a transition between the cribrotic and trabecular forms. In this case a 3×2 cm elliptic hyperostosis spongiosa cranii too was seen on the os parietale. Besides cranium no. 3507 from the area of the Szolnok Waterworks, parietale was also found in another individual. Here a circular osteoporotic area, 1.5 cm in diameter, can be seen on the region enclosed by the sutura sagittalis and coronalis, with hyperostosis of the spongiosa. The majority of research workers today agree that the factors responsible for the development of this process are:

a) malnutrition (HENSCHEN, 1961);

b) iron deficiency anaemia accompanying malnutrition (NATHAN—HAAS, 1966);

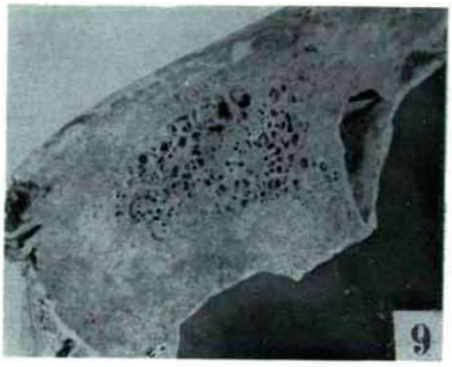
c) iron deficiency anaemia (HENGEN, 1972; CULE—EVANS, 1968);

d) haemolytic anaemia (ANGEL, 1966).

The differentiation of these in historical material is extremely problematical, whereas the recognition of the changes is relatively easy (BRABANT—NEMESKÉRI, 1963).

Changes of a local osteoporotic nature (31), which appear in the form of a fine foramination, were observed on the various parts of the cranium in several cases:
on the area of the arcus superciliaris and the glabella (4 cases);
on the arcus superciliaris and the arcus zygomaticus (1 case);
on the area of the porus acusticus externus and the condylus occipitalis (1 case);
on the ala magna (1 case).

A special classification was made of the crania which can be regarded as examples of senile osteoporosis (32) (PRATOP, 1969). Its typical appearance form is atrophy of the calvaria. It was observed in a total of 5 female cases, all of them from the mature or senile age groups. Mention must also be made here of the skeletal bones of a senile male, which were found to be unusually light, while the marks of absorption too were to be seen on the long tubular bones and on the pelvis.



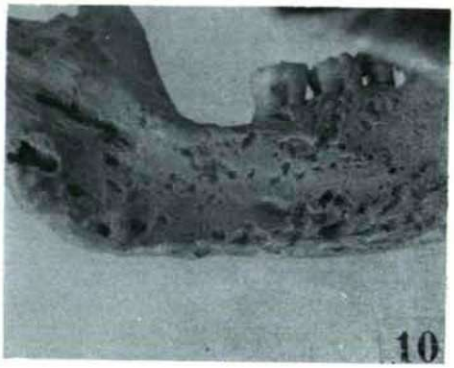


Fig. 9. Hódmezővásárhely—Gorzsa—Czukor farm, Neolithic (Tisza culture), No. 4056, Grave 7. — Cribra orbitalia (cribroticus).
Fig. 10. Lebő, Iron Age, No. 1429, Grave 1. — Myeloma multiplex on the mandible.

Tumours

Meningeoma (33) is a tumour of the cover cells of the arachnoidea, which causes an impression in the cerebral substance and indicates hyperostosis in the adjacent bone tissue (ENDES, 1972). The explanation of this is that, because of the pressure increase due to the tumour, hyperaemia develops in the diploe with the mediation of the ample vascular connections between the dura and the diploe (REGÖLY—MÉREI, 1962). The new bone formed is compact, structureless, but possibly with a radial structure (RATKÓCZY, 1959). Meningeoma has also been mentioned in a prehistoric context (JANSSENS, 1970). On the basis of the above description, meningeoma was assumed for the changes of one male cranium in our material. In this the parietal bone attained a considerable thickness in the corresponding area of the tubera frontalia and in the occipital region; this is shown by the local thickening of the spongiosa. In the region corresponding to the course of the lambdoid suture this thickening resulted in bathrocephalus. The cranium is extremely light. The condylus occipitalis is not parallel with the basal plane and the fossa condyloidea is extremely deep. The X-ray picture shows only the parietal bone

thickening. (We express our thanks to Dr. LÁSZLÓ PÁLDY for the preparation of the picture.)

Myeloma multiplex (34) is a tumour starting out from the reticulum of the medulla, which breaks through the compact substance of the bone to reach the surface (HARANGHY, 1966). It appears in the form of round, sharp-edged bone defects (RATKÓCZY, 1959). Such bone lesions have been reported by Hungarian authors earlier (NEMESKÉRI—HARSÁNYI, 1959). Taking into account another description too (WILLIAMS—RITSCHIE—TERRINGTON, 1941), we explain the cause of such changes in one male cranium on the basis of the photographs (Fig. 10) as myeloma multiplex.

Indentations (35) can be seen on the endocranial surface of four crania (in one case protruding onto the ectocranial surface too), mainly along the sutura sagittalis, in the area of the parietale or the occipitale. In these areas the parietal bone is thinned. In our view some intracranial tumour may be involved, although leptomeningitis too causes indentations in the cranium (WADSWORTH SCHWARTZ, 1941).

Degenerative changes of the articular surfaces of the vertebrae are generally described as spondylarthrosis (36) (VYHNÁNEK, 1971, ACSÁDI—HARSÁNYI—NEMESKÉRI, 1962). On one cranium small exostoses were seen on the anterior edge of the foramen magnum, and on the basis of the flattened state of the condylus occipitalis the phenomenon (Fig. 11) was explained as spondylarthrosis. (Unfortunately, the atlas is missing.)

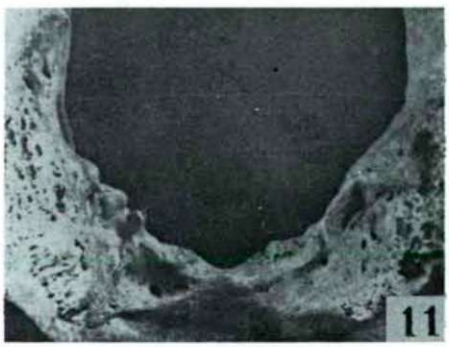


Fig. 11. Szőreg—Pálfy brickworks, early Bronze Age, No. 1737. — Traces of Spondylarthrosis on the condylus occipitalis.

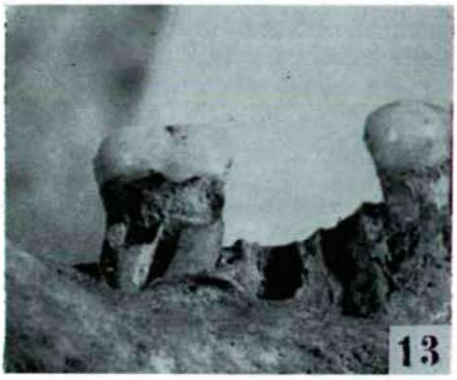
Fig. 12. Vésztő—Mágori hill, Neolithic (Tisza culture), No. 7963, Grave 1. — Injury resulting from a stab (?) on the mandible.

A similar change was seen in the vertabrae of another individual. In this case the degenerative process affected the bodies of the vertebrae. Strong osteophyte formation can be observed on the bodies of the thoracales and lumbales, but less so on the vertebrae cervicales; in the cases of thoracic vertebrae 9 and 10 it can be seen that the two vertebrae are fixed with boney bridges (VYHNÁNEK, 1972). In the literature this osteophyte formation is generally described as spondylosis deformans (37) (NEMESKÉRI—HARSÁNYI, 1959; TULSI, 1972).

Traumas(38)

In several cases the crania exhibited larger or smaller changes indicative of external effects: the mark of a sharp weapon on the os frontale; the deep furrow of the penetration of an arrowhead (?) on a mandible (Fig. 12); in one case the mark of a stronger blow (?) on the area of the os frontale, and in two cases wounds on the top of the head, resulting from blows (?) on the area of the os frontale or parietale.

We do not deal separately with the question of trepanations (39), as these cases already figure in earlier publications (BARTUCZ, 1966).



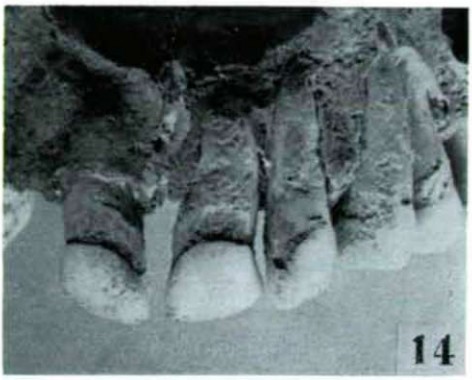


Fig. 13. Szőreg-C, middle Bronze Age, No. 254, Grave 138. — Cercival caries at M_2.

Fig. 14. Szőreg-C, middle Bronze Age, No. 254, Grave 138. — Cement-enamel caries on the incisors.

Teeth

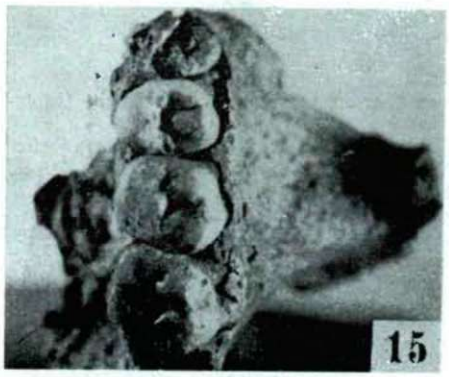
The degree of cariosity on teeth increases in historical times up to the present day. This was already studied in the series under examination here (TÓTH, 1970; TÓTH—SONKODI, 1972). In this respect we refer to these publications. It must be mentioned, however, that in our judgement a study of the frequency of caries (40) in teeth can lead to a realistic result only if the existing teeth of a given type are examined and the caries frequency is expressed as a percentage of the cases examined. Research into the problem is highly justified, for even in finds which are several thousand years old an extremely high degree of caries is found on various sites of the dental crown and root (Figs. 13 and 14).

In connection with the teeth we consider it necessary to turn the rare cases too which occur in prehistoric series. We think primarily of the only supernumerary molar (hyperodontia) (41), presented in Fig. 15.

Diseases of the teeth or periodontium can give rise to abscess or granuloma around the root (REGÖLY—MÉREI, 1962). With its slow growth the granuloma destroys the bone around the root apex, and even the root apex itself(BALOGH, 1958). The cysts are generally larger than the abscess cavities, and round or elliptic in shape (BALOGH, 1958). Their differentiation in historical material means a certain difficulty, and thus in our cases (Fig. 16) we give the combined number of granulomas and cysts (42) present. Fistula too was found in 2 of the 16 individuals; this can occur

as a result of periapical abscess, osteomyelitis, or maxillary sinus suppuration of dental origin (REGÖLY—MÉREI, 1962).

Osteomyelitis of dental origin (43) is either localized or extensive. The osseous surface of the alveolus is uneven, rough and corroded (REGÖLY—MÉREI, 1962). It occurs comparatively frequently in our material (24 individuals), that may be a consequence of the large number of caries cases.



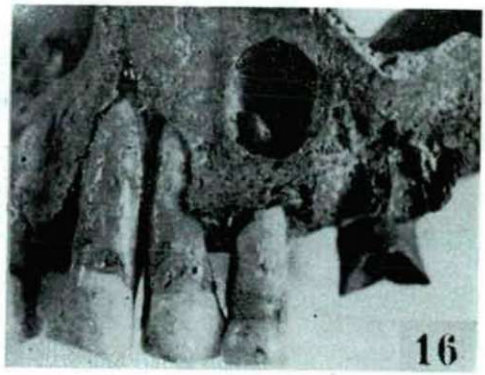


Fig. 15. Hódmezővásárhely—State Farm, Bronze Age, No. 5284, Grave 1. — Hyperodontia (M_4) on the right maxilla.

Fig. 16. Szőreg-C, middle Bronze Age, No. 254, Grave 138. — Cyst at left upper P_1.

Persisting milk tooth (44) was observed in one case, in the area between P_1 and P_2 on a female mandible.

The alveolar edge is strongly rarefied at the front teeth on the mandible of find no. 219 from the Szőreg-C site; on this part the roots have become visible (45).

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